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Integrating Pedagogical Technologies into UK Higher Education: Conceptual Foundations

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RESEARCH IN PROGRESS
INTEGRATING PEDAGOGICAL TECHNOLOGIES INTO UK HIGHER EDUCATION: CONCEPTUAL FOUNDATIONS

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ABSTRACT

The use of software applications to develop and present course material via the internet has raised questions as to how far 'on-line learning' should be integrated into the academic programmes of study provided by higher education institutes. Responses to the opportunities presented by on-line learning in the UK have broadly fallen into three categories: individual departmental initiatives to use pedagogical technologies for a particular unit or programme of study; formation of strategic partnerships with private sector companies; and the founding of university consortia for the purposes of providing on-line courses (Collier 2001). This research puts forward the argument that although educational values and organisational practice have traditionally been held as discrete within academia, responses such as those outlined above will draw the educational and the organisational into a closer relationship with one another. This holds implications for both academic autonomy and professional identity and calls for a detailed account of the role that technologies will play in shaping this re-appraisal of higher education provision. The performative model of society (Strum and Latour 1988) will inform the interpretive, qualitative case study of two universities' responses to the challenge of integrating pedagogical technologies. At this stage, the contribution of this research in progress is to provide some conceptual foundations for considering activities associated with integrating pedagogical technologies from an organisation-wide perspective and to offer some preliminary findings suggested by initial fieldwork.

1. INTRODUCTION

The integration of pedagogical technologies into higher education represents the fusion of two highly influential aspects of contemporary society. Technology and education are considered cornerstones of economic development, progress and social cohesion (Labour Party, 1996, p.2). Almost every aspect of work practice in UK higher education has been transformed through use of information and communication technologies (ICTs). However, until recently, ICTs had not permeated the work of teaching, the learning interactions between teacher and student. These are interactions which are held to be emblematic of the work of higher education. In this research the argument is put forward that as technology is woven into the work practices of teaching, an opportunity is presented to reappraise understandings of educational values, that through careful use of theory, educational values can be understood as enacted, observable and embedded in the organisational practices of the university. Traditionally organisational and educational concerns have been held as discrete within academia. However, it is argued here that educational values are inscribed and enacted within organisational

practice and will therefore be drawn to the foreground of debates concerning the integration of pedagogical technologies.

There are a number of different types of technology implicated by this research. Industry documentation, the press and much of the academic literature talk about this topic area in terms of 'on-line learning' 'e-learning', or else the 'virtual university'. This terminology is useful insofar as it facilitates reference to a broad range of technologies and allows some generalisation regarding activities associated with learning. However, these terms do not afford much transparency when it comes to addressing specific activities and their relationship to specific technologies. In this research the term pedagogical technologies is used in order to place emphasis on the centrality of teaching theory and practice in these debates whilst achieving a sense of the multiplicity of pedagogic models and technologies that exist. This multiplicity is an important characteristic which underlies the complex nature of the choices institutes of education are faced with. Decisions taken and choices made are involving institution wide collaboration which crosses traditional organisational / educational boundaries. Within the context of these choices, teaching practices, course structures, administrative practices and the information systems which support them are all open to re-evaluation as part of the process of integration.

This is research in progress which proposes some conceptual foundations for conducting research into the negotiations and activities arising from the integration of pedagogical technologies at two UK universities. Using the work of actor-network theory (ANT) and the science and technology studies (STS) authors, it will eventually provide a detailed qualitative account of the emergent choices and decisions faced by these institutions and the contingent issues and debates which they inspire. In order to access those debates, fieldwork will involve a series of preliminary interviews designed to identify who, within the university, is engaged with the work of integrating pedagogical technologies, which systems or applications they are concerned with and what negotiations they are currently involved in. The individuals, working groups and documents identified in these interviews will then provide the focus for further observation and interviewing. The advantage of this approach is that the status of issues, events, and forums is proposed by the individuals involved and not imposed by the researcher. This is a particularly relevant method for data collection when a process of potentially radical change is underway. Within the emergent debates, particular consideration will be given to ideas of academic and educational values and how conflicts of interest concerning organisational practice and educational values are expressed and resolved in the course of selecting appropriate technologies and approaches to integration. It is the contention of this research that if, as some have predicted, the course of higher education is to be re-set through the integration of pedagogical technologies, then it is in the alliances and settlements arrived at through these debates and activities that its trajectory will be contested.

2. LITERATURE REVIEW

2.1 'On-Line Learning' Literature

In broad terms the academic literature in this area can be seen as divided into two camps; the oppositionalists and the transformationalists (Boullier 2001). Those involved in producing case studies and providing measures for understanding pedagogical technologies can be generally understood to be transformationalists, given that they have already taken the decision to invest their time and research efforts into the development and implementation of such technology. Oppositionalists, on the other hand tend to call on social theory and theories of education to explicate their viewpoint often without having embarked on defined empirical undertaking. The latter represents a tendency for what Barnett calls 'Armchair research' whereby teachers and academics write articles based on their impressions of the field rather than a specific case or empirical example (1990). By far the largest body of literature available is case study based research describing individual experiences of a particular piece of software in a particular teaching context (Bull, 2000; Jackson

1998). These studies are invaluable and provide some key observations about pedagogical and technological issues both of which require further focus from researchers. A criticism of this body of work is that there is a tendency to be situation specific without providing sufficient theoretical context to link empirical findings to other related bodies of work. Linking the empirical with the theoretical is an issue within this literature but what is striking by omission is that technology itself is hardly theorised at all. If the character of technology is referred to, it is as a medium, a tool, a means to an end (Orlikowski & Iacono, 2001).

A dichotomy can then be seen to exist between case studies written by software developer / teachers which tend to talk exclusively about teaching and software design issues, and articles written by educational theorists which provide invaluable theoretical context but tend to refer to technology in non-specific, undifferentiated terms. In this way, issues relating to design and choice of software as well as any contingent debates pertaining to their integration with existing systems are considered separate to the social, political and educational concerns of the organisation. The idea that they are mutually implicated is not promoted.

Following this line, Alavi and Leidner (2001) call for a "greater depth and breadth in technology mediated learning research". They argue that the IS field is uniquely positioned to contribute to the intellectual development of technology mediated learning because of the field's history and tradition of providing organisational level vision of structures and processes as well as deploying knowledge of IT applications. Alavi and Leidner raise one further point which questions the extent to which dissemination of on-line technologies across the university is being achieved. I would argue that it is through the dissemination of teaching technologies, through attempts to integrate these technologies into the work practices of academia that we will observe the transformation of higher education. The localised development of student intranets, software applications, databases and their associated pedagogic models have proved invaluable to teachers in the short term, but this work stands to be pushed aside in favour of technologies offering a more generic approach to the presentation of course materials which can be more easily integrated with existing information systems and support. It is for this reason that, in contrast to the existing literature, this research adopts an organisational perspective in its consideration of pedagogical technologies.

2.2 Concern For Educational Values

Within the literature some commentators have chosen to place emphasis on the educational and social implications of learning via the internet. One of the most cited concerns is that both the autonomy of the teacher and of the university is compromised through the use of on-line learning. Theories of learning are often used to support the idea that for intellectual development to take place teachers need to have an open relationship with their students, one which is not constrained by the protocols of a software programme. Both Noble (1998), a now infamous oppositionalist author Dreyfus (2001) and Cooley (1980) make the distinction between training and education. They assert that it is possible for students to become competent at a specific, problem-based task through on-line learning but they will never move beyond competency. Sahay (2000) talks about autonomy from the point of view of the student. Given the tendency for bias in on-line learning curricula towards IT, finance and business areas of study, he asks the question, can students be said to be empowered to make an informed choice as to what study they undertake? He refers to the example of on-line learning initiatives the World Bank has funded in developing countries, in particular Mozambique and India, where issues concerning curriculum bias have been raised. The tensions inherent in curriculum bias and between educational and vocational needs are described by Barnett (1990), as the "sociological undermining of higher education" whereby the role of higher education is understood to be altered by government policy so that its sole purpose is to endow students with the appropriate skills and competencies necessary for work. Another concern of the literature is the idea of autonomy and how that idea sits with the vested interests of private companies. This concern has primarily been voiced by universities

in the US where strategies for adopting on-line learning have been felt to be compromised by the vested interests of those involved in on-line learning companies.

The other issue raised by the on-line learning literature is that of social inclusion. 'Social inclusion' as a concept was pushed to the forefront of the New Labour political agenda in the UK along with 'lifelong learning'. It is one of the drivers behind government policies concerning the promotion of on-line learning technologies. However, there is concern that whilst on-line learning may enable more people to learn, there are still considerable costs involved including owning or having access to a computer. Cost and access to technology are both significant factors, but the removal of structural barriers to participation in learning is only one aspect of social inclusion. Rees et al (2000) argues that factors such as time, place, gender, family and initial schooling all play a part in whether an individual understands lifelong learning as something that is relevant to them.

Values pertaining to autonomy and social inclusion identified by the on-line learning literature and the issue of dissemination identified by Alavi and Leidner are used as initial measures of debates which may potentially arise from fieldwork. However, this is empirically grounded research so concepts which arise from the field will not be moulded to fit in with a particular model or theory of educational values, indeed, objectors that resist these theoretical foci are to be encouraged (Sorensen et al. 2001). In the first instance, values will be understood in the forms in which they are expressed within the context of negotiations arising from the field site.

Preliminary fieldwork suggests that autonomy and dissemination will feature prominently in emergent debates and suggests also that these two issues are closely inter-related. A level of consistency between the pedagogical technologies in use within a single university is seen as desirable, both from the point of view of the staff and students who are learning to interact with them and in terms of the work and financial resources required to support them. However, most university departments are associated with a particular ethos or approach to their subject area which informs both their course design and delivery. The distinctive characteristics of which a departments' course provision is comprised may indeed be compromised by the requirements of the pedagogical software or else the contingent requirements of the systems, contracts and work practices with which they are associated.

3. RESEARCH MOTIVATION AND GOALS

3.1 Research Question

The purpose of this research is to provide detailed empirical materials describing the integration of pedagogical technologies into the UK Higher Education sector. To this end it poses the question 'how are pedagogical technologies being integrated into UK universities?' The overview of university responses suggested by Collier (2001) provides a useful context and suggests a useful basis on which to first conceptualise activities taking place in the field. However, rather than providing an overview of responses, this research is concerned with the details of negotiations with private sector companies and proposals for entering into consortia. It considers the debates surrounding individual departmental initiatives, the discussions as to whether (or not) they will be integrated into university-wide strategies. Initial interviews suggest that in the felt conflict between organisational and educational issues the practicalities of upholding values will come to the foreground. Far from being arbitrary, subjective, difficult to pin down, values relating to educational issues are fiercely debated and closely prescribed. Ultimately, this research will consider what can be derived from these contests and debates to assist practitioners and theorists within the field and provide a basis for considering implications for the future of UK Higher Education as a whole.

3.2 UK Higher Education

Some very distinctive challenges have faced higher education in the UK over the past 20 years. The relationship of higher education to government has altered radically in this time. External auditing and

regulation of financial and administrative procedures were imposed by government in 1983 in order to make universities more accountable for the public funds they received. It was made clear that similar interventions would be introduced to evaluate teaching and learning practices if universities did not act. The sector responded in 1990 by establishing the Academic Audit Unit, to conduct independent peer review of quality and standards (Jackson et al. 2000). Increasing demands to meet audit requirements together with directives to significantly expand student numbers were coupled with cuts in funding for both institutions and students have led some commentators to describe the sector as facing crisis (Reeves 1988; Barnett 1990). This is a very important juncture for UK higher education. At this point the question still remains open as to whether or not the UK will follow the same path as the US in its approach to higher education, whether or not we will see increasing disaggregation of the sector and the privatisation of services.

The application of pedagogical technologies and the resulting scope of potential field sites encompasses a range of different settings. Their use in the provision of training within organisations, in developing countries and in schools clearly hold the potential to alter the way in which learning and teaching are conceived. However, at this point in time higher education institutes are either directly involved or else implicated through partnerships and alliances in almost all developments in this field. The timeframe during which much of this involvement was initiated was 1997 to the end of 2000 when on-line learning was identified as a major growth market and attracted the attention of venture capitalists and big investors. The market fixed its attention on the higher education sector, primarily because this sector holds the relevant pedagogical expertise and was also already in a position to take advantage of an established customer base. The activities of the market brought a considerable amount of hype and speculation about the future of higher education. The fully virtual, global university was just around the corner with video-streamed lectures, chat room style seminars and on-line graduations (UNext 1999). A lot of companies emerged at this time whose aim was to supply on-line courses or else the technology to support them. Many of those companies don't exist now or have had to hugely scale down and realign their operations as a result of the recent stock market crash in technology shares. In amongst the hype and uncertainty higher education institutions have had to find a way to respond and engage with the concepts and practicalities of providing on-line learning in the long term. To a greater extent than any other provider of education they are having to consider the extent to which pedagogical and internet technologies will transform their work practices.

4. RESEARCH METHOD AND APPROACH

4.1 Theoretical Basis For Data Collection

The fieldwork design for this research is informed by the work of the actor-network theory (ANT) and science and technology studies (STS) authors. These authors represent an amorphous group of writers loosely bound by a common interest in the philosophy of science. Particularly with regard to ANT, these authors have stated a desire to resist the creation of a canon of theoretical work from which a fixed set of principles can be derived (Law 1999). Broadly speaking interpretive, empirically grounded qualitative research is advocated, informed by an understanding of structuralism and semiotics as promoted by authors such as Foucault and Greimas.

As a touchstone, Latour and Strum's work on the 'Performative Model of Society' (1987) has provided a basis for fieldwork design and the collection of empirical materials. The performative model is derived in part from Garfinkel's Ethnomethodology (1967). Garfinkel proposes a view of sociology in which society is achieved through interaction, rather than "it being a given, existing, structure within which interaction takes place". The performative model provides a hypothetical basis, or what Latour refers to as a perspective frame, through which activities taking place within the field can be viewed. Activities are understood in relation to the following tenets:

- no one, including the researcher, has a privileged view of events
- actors, regardless of their size, define for themselves and for others what society is

- a variety of elements or properties can contribute to social relationships, whether they be material, symbolic or human

An extension of the premise that no actor has a privileged viewpoint, is that all actors are understood as equal, as having equal access to the practical means necessary for them to achieve a definition of society and organise others around that definition. The more actors are understood to be equal in principle, the more apparent practical differences in the means available to them become. Macro and micro considerations of how versions of society are secured are schematically levelled by understanding them as they are experienced in practical terms. This is an acknowledgement that the range and extent to which these factors are permitted to act in a situation is partly defined by those involved and so does not rest purely on criteria pertaining to size or scale.

With this theoretical perspective in place Collier's (2001) summary of university responses to on-line learning, or 'e-learning' as he calls it, has been used as an initial framework for understanding activities taking place. Departmental initiatives, partnerships with private sector companies and formation of alliances with other universities are the three areas of activity he has identified but he also makes the point that there are a significant number of universities who have yet to engage in concerted efforts to introduce on-line learning into their provision of courses. He interprets this as universities wanting to 'wait and see' which modes of delivery are successful before committing themselves to investing money from their already limited funds.

Initial inquiry has led to two universities which between them exhibit all three of the responses that Collier identifies. Using two universities in this way provides a means for comparing the influences which are understood to have caused them to respond in different manners. Having used Collier's summary to identify key areas of activities, his framework was then put to one side in order to let the activities taking place at these two field sites take on their own form. Preliminary, semi-structured interviews with individuals identified as responsible for a particular area of development have taken place. Each interviewee was asked to describe his or her work, the individuals, groups and forums with whom they are associated, the technologies with which they are involved and the issues that they are currently facing. As well as identifying and describing groups, individuals and technologies interviewees were asked to provide copies of any documentation referred to during the interview, such as committee reports, minutes of meetings, user manuals, service contracts, license agreements. Invitations to forthcoming events mentioned in the interview were sought and descriptions and documentation pertaining to past events described as significant were requested. Where possible attendance of meetings and involvement in correspondence was also asked for, as well as passwords and usernames to enable the researcher to interact with the technologies in question.

Having taken account of the individuals, activities and technologies described in these interviews and the documents associated with them, further interviews have been arranged. Access to a number of meetings and working groups identified as significant has also been granted. This process of interviewing, observing and collecting documentation will continue until December 2002, by which stage, each of the universities in question will have reached a significant juncture in their attempts to promote and integrate pedagogical technologies.

In all cases, the outcome of these fieldwork activities is a text; whether it be an interview transcript, minutes of meetings, descriptions of a technology or impressions noted by the researcher. Each of these texts provides a basis for following the activity taking place and planning the next phase of involvement. Whilst it may not be possible to follow up every single reference made within a document, fieldwork texts collected in this way provide a material trace representing a set of relationships as derived from an actual event. As such, the researcher's construction and choice of focus can be re-traced and held up for inspection. On this count, it is also important to note that activities dismissed as inconsequential by one interviewee may be identified as pivotal by a related piece of documentation or in the issues debated in a working group. In these instances, the tenet within the performative model of society concerning the equal value of everyone to define their world

view for themselves and for others is called to the fore and the discrepancy between the two accounts considered more closely.

The intention of this work is not to simply construct a map of the network of relationships that join people in their efforts to introduce pedagogical technologies. It is to understand the work involved in creating these relationships, in forging alliances and enlisting technologies and present the tensions, issues and debates that arise from this activity. These tensions can be seen in the characterisation of relationships between groups, individuals and technologies as they appear in the texts compiled. Understanding events as performed and emergent means that each text is representative of a set of relationships as they existed at that particular point in time. As such, they begin to propose their own conceptual foci which once presented can be considered in relation to other relevant theories and empirical findings.

4.2 Theoretical Tools For Analysis

As previously stated, this is qualitative research from which much of the empirical material collected will be texts. A preliminary strategy for analysing texts which is consistent with the theoretical basis for data collection has therefore been adopted. The French school of semiotics, particularly that form of semiotics proposed by Greimas (1990) and Barthes (1957) is seen as offering insights for considering the structure or texts. Greimas emphasises the structural features of text using whole discourses or narratives as primary bearers of meaning as opposed to simply words or sentences on their own. Barthes, on the other hand, takes the arrangement of signs and symbols in texts and speech to the non-verbal world of cultural artifacts, interpreting the signs and symbols suggested by clothes or buildings. This particular type of semiotics comes from a structuralist tradition, whose theoretical foundations differ from those of the ANT authors. Hard semiotics promotes an understanding of the world purely based on texts, actors and structures. Law (1999) differentiates the position adopted by ANT by saying that the theory promotes the concept of texts and structures as outcomes that are not 'given' in the order of things. Despite these philosophical differences, this form of semiotics offers some useful tools for analysis for research conducted according to the methods of ANT.

Classification theory as proposed by Haraway (1988), and Bowker & Leigh Star (1999) also offers a useful conceptual basis for considering the ways in which order and structure can be understood as performed. Classification theory, as promoted by these authors, provides a critical understanding of the use of classification systems, sensitising the researcher to the enormous amount of work that goes into creating and maintaining a classification system and the controversy and tension that are inevitably present. Reflecting teaching practices or course structures in a piece of pedagogical software requires that the course or teaching practice conforms to the structure and language of the technology concerned. This may involve an element of compromise particularly where the course assessment or course structure doesn't 'fit' or where work practices have to be redefined. For instance, most web based pedagogical technologies require that programmes of study are broken down into a number of self-contained units of study or modules with clearly described learning outcomes and objectives. Modularity, as a philosophy for course provision, has been fiercely debated within UK academic institutions. The idea that education in an academic subject can be broken down into discrete elements is objected to by those who are reluctant to see higher education understood as simply the assemblage of skills. Therefore, integrating non-unitised courses into software designed to accommodate discrete study components is contentious. There are serious implications for the dissemination of pedagogical technologies if some form of compromise cannot be reached.

As well as having implications for the structure of courses, the work involved in integrating pedagogical technologies also holds implications for reconsidering work practices and roles within universities as well as the status of certain central systems and organisational practices. Integrating pedagogical technologies into a department's work requires concerted effort from technical, academic and administrative staff who are often drawn into much closer proximity to one another. In this scenario, there is potential for the boundaries between work practices to appear less self-evident and

for new roles and activities to emerge. Re-structuring work practices is another area where classification theory can be usefully applied. Some of the most impressive work on classification has come from feminist authors, two of which are mentioned above. Feminist authors are trained in reading texts and situations in terms of who or what has been systematically left out, who is attempting to speak on behalf of whom. Integrating organisational practices into technical systems involves articulating, naming, classifying and describing work practices. This is an enormous task, which requires an understanding of the political implications of asking, for example, that an academic become involved in issues pertaining to central administrative systems, or that an IT support person become involved in course design and presentation. It is in this reconfiguration of boundaries that discussions are provoked concerning the current status quo and a sense of impending change is felt.

5. RESEARCH CONTRIBUTION AND LIMITATIONS

It is argued here, on the basis of preliminary fieldwork, that the integration of pedagogical technologies into UK higher education will hold implications for both organisational practices and for understandings of educational and academic values. The practical requirements of the institution, the work of designing and maintaining its administrative and technical systems, is generally understood to be something which stands apart from 'the real work' of teaching and learning. However, with the integration of pedagogical technologies the interrelatedness of these areas of work is brought to the foreground and the tension between values and their practical manifestation is highlighted. In order to promote understanding of how pedagogical technologies are being integrated and to consider the emerging issues associated with academic autonomy, dissemination and professional identity, the case for an organisation-wide approach to empirical work has been put forward.

With this in mind, conceptual and theoretical foundations for this research have been selected which can accommodate both the depth and breadth of the discussions and activities taking place. The representation of these activities as fieldwork texts provides a material trace from which choice of focus and grounds for analysis can be held up for inspection by others working in this field. A criticism of ideas associated with ANT has focussed on its failure to take account of the wider picture of social and political structures that limit individuals' ability to act (Walsham 2000). Whilst it is true that empirical materials are not accounted for in terms of macro and micro influences, that is not to say that theories which do focus on these levels of analysis cannot be used as comparative analytical measures once case study materials have been collected. Once the theory of the fieldwork has been shaped through the analysis of documentation, this theory can, and probably should, be considered in relation to other empirical cases as well as relevant theories and perspectives.

Outcomes of this research in progress are expected to hold implications for theories of higher education and theories of technology. Considering how values are promoted and contested during the integration of new technologies in this context provides an opportunity for documenting educational values as they are defended and enacted. Promoting understanding of these debates and the role that various technologies play within them will assist those involved in the practicalities of integrating pedagogical technologies. In this way it intends to contribute to the process of dissemination to which Alavi and Leidner call attention. Dissemination in this sense will address issues associated with the organisational / educational divide as well as issues associated with institution-wide access to pedagogical technologies.

The chosen research area of higher education, as well as being one of the main areas of activity surrounding the development and integration of pedagogical technologies, provides a useful context for understanding values and principles that cannot always be reconciled with organisational or business imperatives. Although less visible, values and principles such as these can be understood as present in business and organisational cultures everywhere. For instance, public health service provision is another example where the politics and ethos of healthcare are often felt to be challenged by the technical and organisational realities of caring for patients (Bowker and Leigh Star 1999).

Understanding how ethical considerations are contested and dealt with during the integration of new technologies is an important area of this and future research. By the time of the conference it is hoped that some articulation of these values as they pertain to this case will have been achieved and can be given further consideration in relation to issues relevant to the field of information systems.

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